

25. A method for manufacturing a head base according to claim 24, wherein:
said thermoplastic substance is hydrated glass.

26. A method for manufacturing a head base according to claim 18, wherein:
said relief pattern formed on said green sheet has at least one recess
having a tapered shape.

30. A method for manufacturing a head base according to claim 18, wherein:
said nozzle ports are formed by a lithographic method.

REMARKS

Claims 1-4, 6-10, 14, 18-20, 22-26 and 30 are pending. Claims 1, 2, 18-20, 22-26 and 30 have been amended as described herein. Reconsideration is respectfully requested in light of the amendments and remarks made herein.

In response to the rejection of claims 1-4, 6-10 and 14 under 35 U.S.C. § 112, second paragraph, applicants have deleted the language "having a prescribed relief pattern" following the first recitation of "green sheet" in independent claim 1 to remove any perceived ambiguity regarding the green sheet's relief pattern. Further on in the claim, following the second recitation of the "green sheet," where the relief pattern is described, "in response" has been changed to "corresponding." This change is not intended to affect the scope of any claim; it is merely to clarify the claim language. The green sheet's relief pattern corresponds to the concave portion defining the ink pressure chamber. A non-narrowing amendment has also been made to claim 2 to cure any perceived ambiguity regarding the relief pattern. As such, it is believed that all pending claims satisfy the requirements of 35 U.S.C. § 112, second paragraph.

With regard to the art rejections, claims 18-20, 22, 23, 26 and 30 are rejected under 35 U.S.C. § 102(b) based on JP '141; claims 1-3, 6, 18-20 and 22 are rejected under 35 U.S.C. § 102(b) based on JP 4-338550 (JP '550); claims 4, 7, 14, 23 and 30 are rejected under 35 U.S.C. § 103(a) based on JP '550 in view of Trueba; and claims 8, 9, 24 and 25 are rejected under 35 U.S.C. § 103(a) based on JP '550 in view of Moynihan.

Regarding the rejection of claims 18-20, 22, 23, 26 and 30, the Examiner will note that these claims, as well as claims 24 and 25, are now method claims. Certain structural features are recited in the preamble of independent claim 18. These claims, as amended, contain the same features as before, but they are now presented to highlight the process features. Accordingly, the language regarding the manner in which the head base is formed must be considered in determining patentability. The further features added by dependent claims 19, 20, 22, 23-26 and 30 must likewise be considered in determining patentability.

JP '141 does not disclose nor teach forming a head base as recited in independent claim 18. Rather, JP '141 discloses a structure that has a base plate comprised of a non-conductive pattern formed on a conductive Ni substrate. After a releasable film is formed on the surface of the base plate containing the non-conductive pattern, an electroforming Ni film is precipitated on the releasable film and released from the base plate to produce the orifice plate.

Accordingly, it is respectfully submitted that each of claims 18-20, 22, 23, 26 and 30 is patentably distinguishable over JP '141.

Turning now to the rejection of claims 1-3, 6, 18-20 and 22 based on JP '550, this reference teaches a method of manufacturing an orifice plate. A substrate 20 is heated in a steam atmosphere to modify a specific depth of the substrate to thereby form layer 21. A photo resist pattern 22 is formed on layer 21, and the exposed portions of layer 21 are etched away. The photo resist is then removed to reveal a non conductive pattern 21a on the substrate. A releasing film 23 is then applied followed by application of a Ni electroforming film 24 as shown in Figs. 2(e) and 2(f) of JP '550. The electroforming film is then peeled from the substrate to obtain the orifice plate 11 shown in Fig. 2(g). According to the Examiner, applicants' claimed green sheet is the structure shown in Fig. 2(d) of JP' 550 and applicants' claimed head base is the orifice plate shown in Fig. 2(g) of that reference.

However, the orifice plate of the reference does not have a concave portion defining at least one ink pressure chamber, as does the head base of applicants'

X (claims. The rectangular shaped openings on the bottom surface of the orifice plate 11 are not ink chambers; such openings are merely part of the respective orifice. Also, the pattern 21a on the substrate 20 is not in response to the concave portion defining the ink chamber(s). Thus, JP '550 does not disclose nor teach a green sheet having a relief pattern corresponding to the concave portion defining the ink pressure chamber (s). The substrate 20 and pattern 21a of JP '550 only corresponds to a portion of the nozzle openings.

Accordingly, it is respectfully submitted that each of claims 1-3, 6, 18-20 and 22 is patentably distinguishable over JP '550.

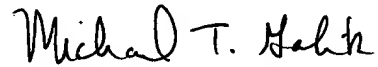
With respect to the Trueba patent, which has been applied to claims 4, 7, 14, 23 and 30 and which was discussed in the previously submitted Amendment, that patent does not overcome the deficiencies in JP '550. Moreover, since each of these claims is directly or indirectly dependent on either claim 1 or 18, it is submitted that these claims are also allowable.

Similarly, the additional references, Moynihan and Sachdev, applied with JP '550 to reject claims 8, 9, 24 and 25, and claims 10 and 26, respectively, do not offset the shortcomings of the primary references, as applied to independent claims 1 and 18. Moreover, since each of these claims is directly or indirectly dependent on either claim 1 or 18, it is submitted that these claims are also allowable.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration of the present application. Should the Examiner believe that issues remain outstanding, he is respectfully

requested to contact applicants' undersigned attorney at (408) 952-6126 in an effort to resolve such issues and advance the case to issue.

Respectfully submitted,



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Version With Markings To Show Changes Made

1. (Four times Amended) A method of manufacturing an ink jet printer head having a head base, comprising the steps of:

manufacturing a green sheet ~~having a prescribed relief pattern in~~ response to said head base, said head base comprising a plate in which a nozzle port is formed and a concave portion defining an ink pressure chamber, said green sheet having a relief pattern ~~in response~~corresponding to the concave portion defining said ink pressure chamber; forming said head base by coating and solidifying a material for forming said head base on a surface of said green sheet having said relief pattern; stripping off said head base from said green sheet; and forming the nozzle port for discharging the ink on said head base.

2. (Amended) A method of manufacturing an ink jet printer head according to claim 1, wherein:

said green sheet manufacturing step comprises a step of forming a resist layer ~~in response to a prescribed pattern on~~ a substrate of said green sheet, and then manufacturing said green sheet by forming said relief pattern on said substrate of said green sheet by etching.

18. (Three times Amended) ~~An ink jet printer head~~A method for manufacturing a head base having a concave portion defining a plurality of ink pressure chambers, and a plate in which corresponding nozzle ports are formed, the method comprising:

~~a head base having a concave portion defining a plurality of ink pressure chambers, and a plate in which corresponding nozzle ports are formed;~~

~~wherein said head base is formed by coating and solidifying a material for forming said head base on a surface of a green sheet having a prescribed relief pattern corresponding to the concave portion defining the plurality of pressure chambers, stripping off said head base from said green sheet, and forming the nozzle ports for discharging the ink on said head base.~~

19. (Twice Amended) ~~An ink jet printer head~~A method for manufacturing a head base according to claim 18, wherein:

said head base is formed by forming a resist layer in response to a prescribed pattern on a substrate of said green sheet, and then manufacturing said green sheet by forming said relief pattern on said substrate of said green sheet by etching.

20. (Amended) ~~An ink-jet printer head~~ A method for manufacturing a head base according to claim 19, wherein:

said substrate of said green sheet is one of a silicon wafer and quartz glass.

22. (Amended) ~~An ink-jet printer head~~ A method for manufacturing a head base according to claim 18, wherein:

the material for forming said head base is a substance hardenable by imparting energy.

23. (Amended) ~~An ink-jet printer head~~ A method for manufacturing a head base according to claim 22, wherein:

said energy is at least one of light and heat.

24. (Amended) ~~An ink-jet printer head~~ A method for manufacturing a head base according to claim 18, wherein:

said head base is formed of a thermoplastic substance.

25. (Amended) ~~An ink-jet printer head~~ A method for manufacturing a head base according to claim 24, wherein:

said thermoplastic substance is hydrated glass.

26. (Twice Amended) ~~An ink-jet printer head~~ A method for manufacturing a head base according to claim 18, wherein:

said relief pattern formed on said green sheet has at least one recess having a tapered shape.

30. (Twice Amended) ~~An ink-jet printer head~~ A method for manufacturing a head base according to claim 18, wherein:

said nozzle ports are formed by a lithographic method.